DEVON RIVER AUTHORITY

RIVER DART SCALE READING INVESTIGATION - 1972

The object of this investigation is to examine by means of scale reading the biology of age classes of the salmon population of the River Dart.

In 1967 the final report on a five-year scale reading programme was summarised. At that time it was considered that sufficient information had been gathered to help with restocking programmes and the management of salmon in the River Dart.

Since that time the advent of U.D.N. and the increase in high-seas netting for salmon caused the Authority to reconsider the scale reading programme

In 1971 a further scale reading programme was started in an attempt to monitor changing patterns in salmon runs that may be caused by the new influences This was continued in 1972 but it has now been decided that this will be the last report in this programme.

As the most important factor is the fish that are cropped, this investigation was limited to scales collected in the open fishing season and also related to the net catches only as U.D.N. has reduced rod catches to a level where scales from that source would not be statistically viable.

For ease of reference the report is arranged in sections, as in previous years, and tables referred to in the report form an appendix, except for Table 1 which is included in the text on page 2.

A - METHODS

B - NET COLLECTION

C - GENERAL

D - DISCUSSION

A. METHODS

Collection of Scales

Scales were collected from fish taken during the normal open season, which in 1972 was:

Nets 15th March - 16th August.

A weekly close time was in operation for the nets from 6 a.m. on Saturday to 6 a.m. on the following Monday, a period of 48 hours.

Eighteen licences were issued for draft or seine nets for the 1972 season.

Number of Scales Collected

761 (517) sets were collected from NET caught fish.

Total for the 1971 season is shown in brackets.

Examination of Material

The techniques of mounting, projecting and reading were the same as those employed in previous years.

Inevitably some sets of scales were received which, for various reasons, could not be read or recorded and these were discounted from the final totals used for statistical analysis.

B. THE NET COLLECTION

An examination of Table 1 shows that scales were collected from over half (83.8%) of the total number of fish reported to have been taken by nets in 1972.

Reference to previous reports shows that in other seasons overall percentage samples were:

1962	57.6%	(scales collected/total declared catch)
1963	72.6%	" " " " "
1964	64.7%	" " " " "
1965	44.1%	" " " " "
1966	43.9%	" " " " "
1967	56.5%	" " " " "
1971	76.4%	" " " " "
1972	83.8%	" " " " "

The effectiveness of sampling effort was very high at the beginning of the season and continued to be very satisfactory for the remainder of the season.

Table 1 Comparison of Monthly Net Catches with Scale Sample Collected

Month	Number Caught	Scales Collected	% Total
March	21	19	90.5
April	51	43	84.3
May	206	178	86.4
June	207	171	82.6
July	299	252	84.3
August	124	98	79.0
Total	908	761	83.8

Composition of Catch

Tables 2, 3, 4 and 5 in the Appendix set out the statistics for the the net collection and some of these results are illustrated in histogram form in Figures 1, 2, 3 and 4. It can be seen from these tabulated results that:

(i) The majority of the scales in the collection were classified into the three groups of fish; grilse, small spring and small summer fish. Together these year classes make up 97.3% of the collection.

(ii) The trend for grilse to be an increased part of the catch continues and now makes up 35%. However, small spring fish, at 52% of the catch, are the highest recorded group. The small summer fish group is not well represented in the 1972 sample, making up only 10% of the catch, compared with between 30-50% in the early 1960's.

(iii) The only other group in the 1972 collection is large spring fish but is only a very small part of the collection.

(iv) The largest and smallest fish in the year classes can be scheduled as follows (date of capture in brackets):

Year Class	Smallest	Largest
1+ (Grilse)	3½ lbs (11.7.72)	10½ lbs (26.6.72)
2 (Small Spring Fish)	4½ lbs (22.6.72)	17½ lbs (17.5.72)
2+ (Small Summer Fish)	6½ lbs (7.6.72)	16 lbs (6.7.72)
3 (Large Spring Fish)	9½ lbs (19.7.72)	18 lbs (18.5.72)
3+ (Large Summer Fish)	15 lbs (7.8.72)	
Sm (Previous Spawners)	-	-

The headings 'Smallest' and 'Largest' refer to weight only.

The average weights of the various year classes recorded are as follows (averages for 1962, 1963, 1964, 1965, 1966, 1967 and 1971 are included as a basis for comparison):

Year / Class	1962	1963	1964	1965	1966	1967	1971	1972
1+	6.15	5.95	5.72	5.61	6.1	6.26	5.6	6.4
2	9.31	10.01	8.73	9.19	9.7	9.78	9.5	10.0
2+	9.98	11.13	9.60	9.61	10.5	10.47	10.4	11.4
3	15.3	15.4	15.1	13.8	16.4	15.42	12.8 (3)	13.9
3+	20.0 (1)	19.3 (3)	17.2 (2)	-	16.0 (2)	-	-	15.0 (1)
Sm	16.6	16.4	13.8 (9)	15.8	13.7 (6)	15.56 (9)	13.3 (5)	-

Where the number of fish used for calculating the average weight is below 10, it is shown in brackets.

Time of Run

Table 5 and Figure 4 in the Appendix show the distribution of sea-age class captures throughout the season and from these it can be seen that:

(i) Fish caught in March were large spring fish - 42%, and small spring fish - 58%.

(ii) Of the year classes sampled in April 97% were small spring fish and 2.3% large spring fish.

(iii) 96% of the fish sampled in May were small spring fish.

(iv) Grilse began to appear in June, making up 6% of the sample. Small spring fish were still running; they were represented as 78% of the sample.

(v) Grilse became the most sampled year class in July and 70% were of this year class. 13% of the July sample were small spring fish and 13% small summer fish.

(vi) 80% of the fish sampled in August were grilse.

C. GENERAL

Table 4 shows the age of smolts at the time of migration to sea. It can be seen that the vast majority of parr become smolts at two years old. A very few fish migrated after spending three years in the river and still fewer after only one year of river life.

D. DISCUSSION

The results of the 1972 season's investigation show a pattern of basic information which is comparable to investigations of previous years. The results can be summarised as follows:

(a) Grilse make up one third of the fish caught.
(b) The dominant group in 1972 was the small spring fish.
(c) Small summer fish make up a much smaller proportion of the net catches.

No attempt has been made in the season's investigation to cover any fish running into the river outside the normal open seasons for nets and rod and line.

ACKNOWLEDGEMENTS

The Authority would like to thank all persons assisting in this scale reading investigation, particularly the netsmen for their efforts in taking scale samples; scales were taken from over three-quarters of the season's catch.

REFERENCE

Reports of previous seasons' work on this and other rivers on scale reading and population surveys are available on application to the Fisheries Officer.

January 1973

F.J. NOTT
Fisheries & Pollution Prevention Officer

Fisheries & Pollution Prevention Department,
Devon River Authority,
County Hall,
EXETER,
Devon.

Table 2 Sea-Age Classes and Weights

Class	Scale Sample	% of Total	Total Weight of Class(lbs)	% of Total
1+	266	35.0	1,703.50	25.0
2	398	52.3	3,979.50	58.0
2+	76	10.0	873.25	12.7
3	20	2.6	278.50	4.1
3+	1	0.1	15.00	0.2
Sm	-	-	-	-
Total	761	100.0	6,849.75	100.0

Table 3 Monthly Distribution of Sea-Age Classes

Month \ Class	1+	2	2+	3	3+	Sm	Total
March	-	11	-	8	-	-	19
April	-	42	-	1	-	-	43
May	-	171	2	5	-	-	178
June	10	133	27	1	-	-	171
July	178	34	35	5	-	-	252
August	78	7	12	-	1	-	98
Total	266	398	76	20	1	-	761

Table 4 Smolt Age at Migration

Class \ Smolt Age	1-year	2-year	3-year
1+	-	259	7
2	5	388	5
2+	1	74	1
3	-	20	-
3+	-	1	-
Sm	-	-	-
Total	6	742	13

Table 5 Monthly Catches of Salmon corrected to show proportions of year classes using percentage representation from Table 3

Month \ Class	1+	2	2+	3	3+	Sm	Total
March	-	12 (57.9)	-	9 (42.1)	-	-	21
April	-	50 (97.7)	-	1 (2.3)	-	-	51
May	-	198 (96.1)	2 (1.1)	6 (2.8)	-	-	206
June	12 (5.8)	161 (77.8)	33 (15.8)	1 (0.6)	-	-	207
July	211 (70.6)	40 (13.5)	42 (13.9)	6 (2.0)	-	-	299
August	99 (79.6)	9 (7.1)	15 (12.3)	-	1 (1.0)	-	124
Calculated Totals of each Year Class	322	470	92	23	1	-	908
%	35.5	51.8	10.1	2.5	0.1	-	100.0

Fig.(1) Grilse (1+) - Weight Distribution

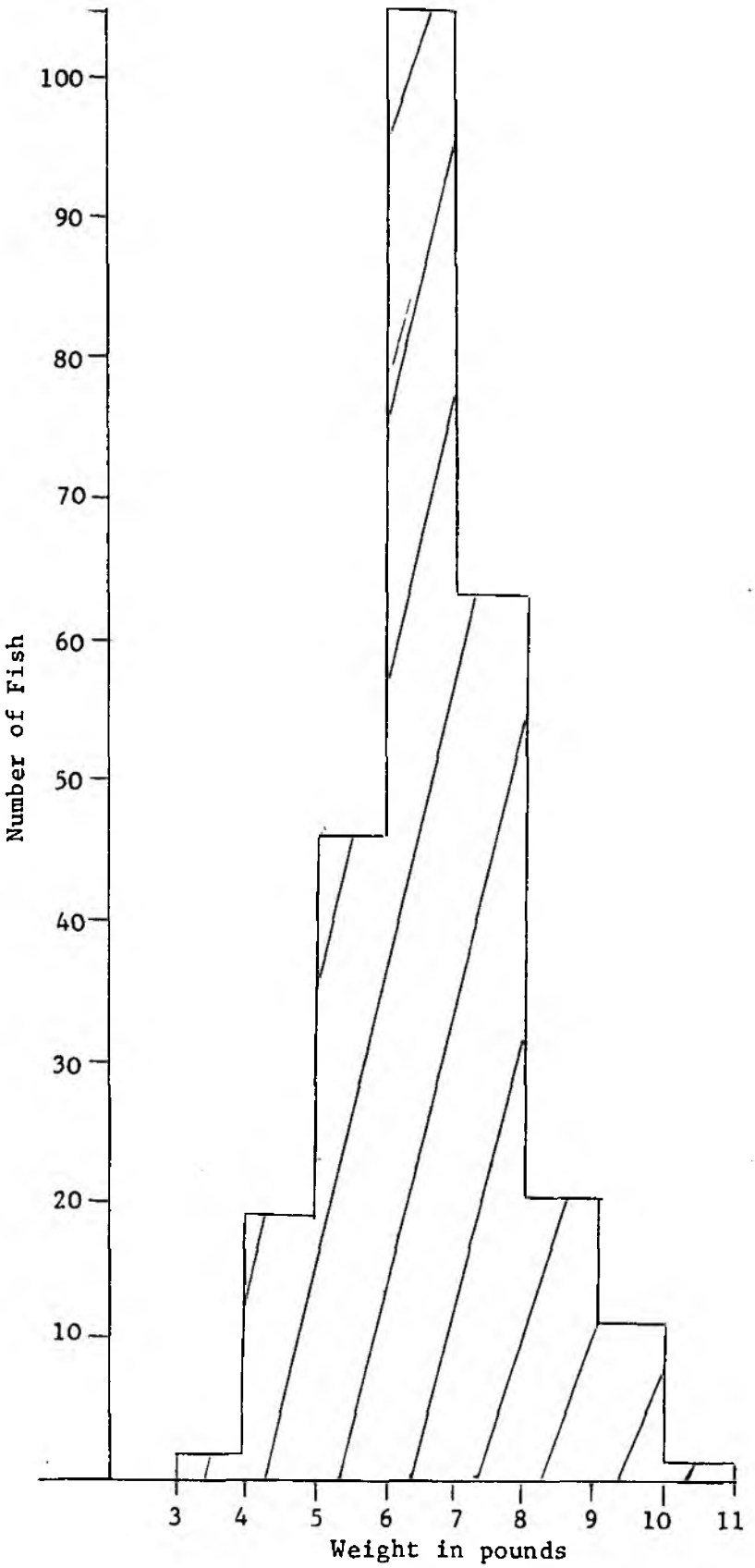

Fig.(2) Small Spring Fish (2) - Weight Distribution

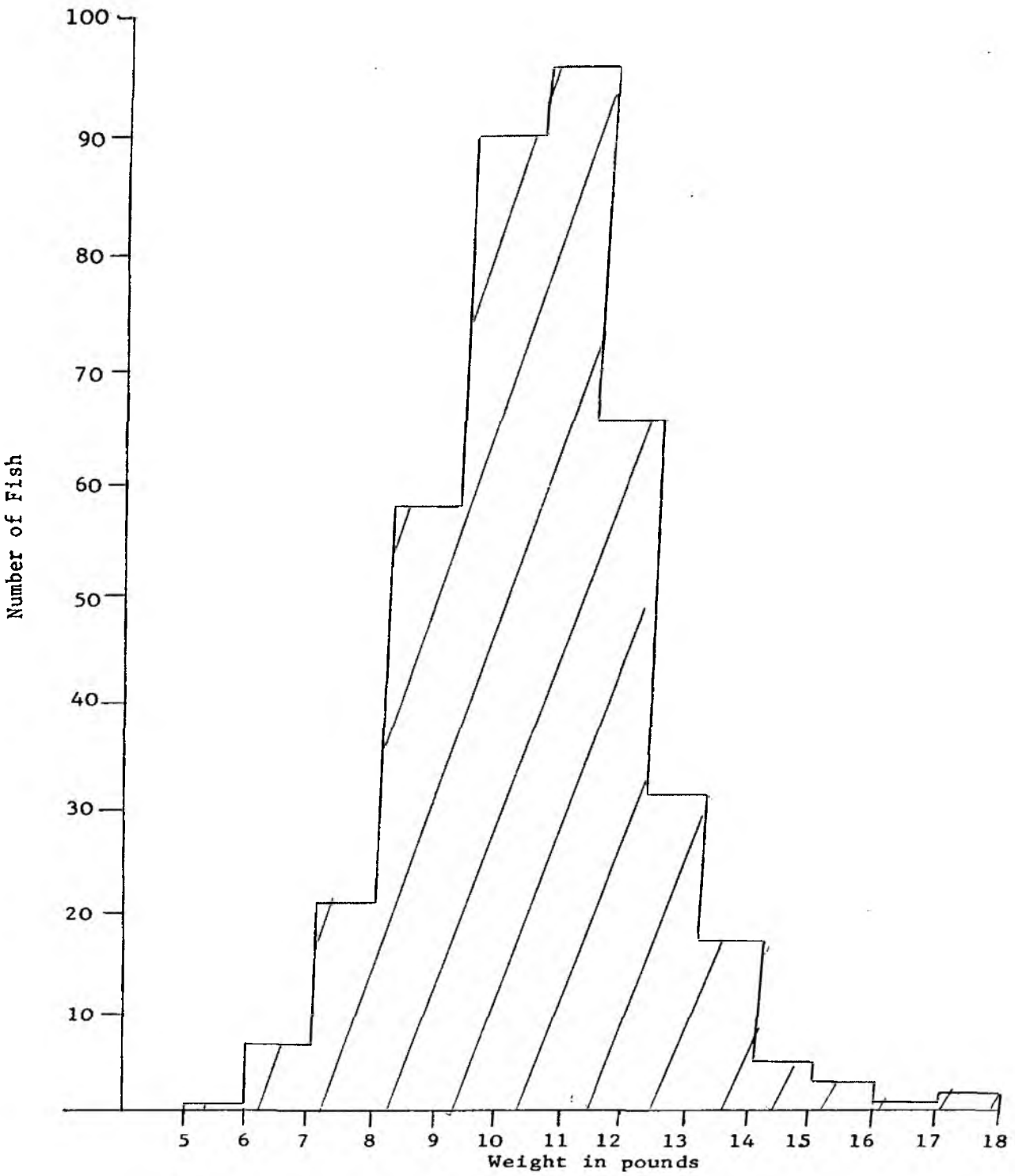

Fig.(3) Small Summer Fish (2+) - Weight Distribution

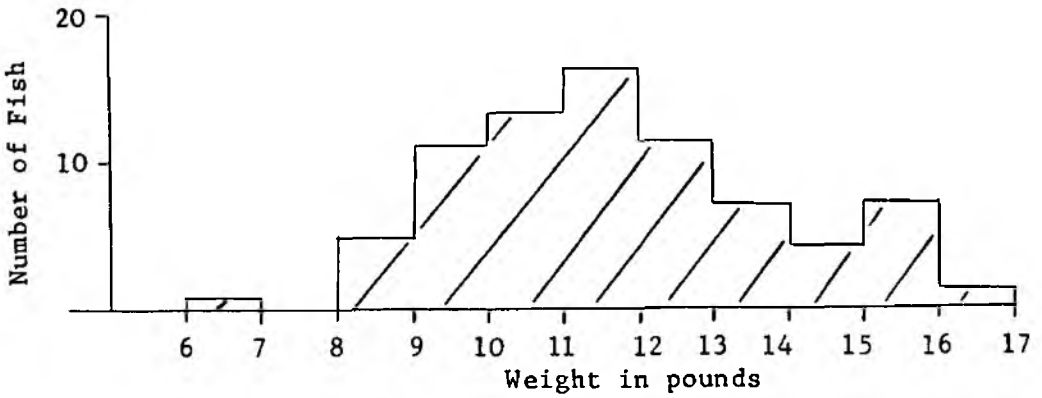

Fig.(4) Percentage Monthly Distribution of Sea-Age Classes